

# SMITHSONIAN NATIONAL AIR AND SPACE MUSEUM REVITALIZATION

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## HEARING BEFORE THE COMMITTEE ON HOUSE ADMINISTRATION HOUSE OF REPRESENTATIVES ONE HUNDRED FOURTEENTH CONGRESS SECOND SESSION

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## SMITHSONIAN NATIONAL AIR AND SPACE MUSEUM REVITALIZATION

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WEDNESDAY, JUNE 22, 2016

HOUSE OF REPRESENTATIVES,  
COMMITTEE ON HOUSE ADMINISTRATION,  
*Washington, DC.*

The Committee met, pursuant to call, at 10:37 a.m., in room 1310, Longworth House Office Building, Hon. Gregg Harper presiding.

Present: Representatives Harper, Davis, Comstock, and Vargas.

Staff Present: Sean Moran, Staff Director; John Clocker, Deputy Staff Director; Katie Patru, Deputy Staff Director; Mary Sue Englund, Director of Administration; Erin McCracken, Communications Director; Cole Felder, Legal Counsel; C. Maggie Moore, Legislative Clerk; Tim Sullivan, Staff Assistant; Jamie Fleet, Minority Staff Director; and Matt Pinkus, Minority Senior Policy Advisor.

Mr. HARPER. I now call to order the Committee on House Administration for today's hearing on the Smithsonian Institution's National Air and Space Museum Revitalization. The hearing record will remain open for 5 legislative days so that Members may submit any materials that they wish to be included. A quorum is present, so we may proceed.

I welcome our two witnesses, the Secretary of the Smithsonian, Dr. David Skorton, and the Under Secretary for Finance and Administration and Chief Financial Officer for the Smithsonian, Albert Horvath. This is the first appearance of Secretary Skorton before our Committee. He has served as the 13th Secretary of the Smithsonian Institution since July of last year.

And we welcome you both.

Congress established the Smithsonian in 1846 to carry out the will of English scientist James Smithson. Smithson sought to create an establishment for the increase and diffusion of knowledge. Since that time, the Smithsonian has developed into the largest museum and research complex in the world, with 19 museums, 9 research centers, and the National Zoo.

A major responsibility of the Smithsonian is to collect unique artifacts, which have shaped our Nation's heritage, and showcase some of those items so that they may be used as educational resources for today's generation and for generations to come.

The Committee on House Administration works closely with Smithsonian staff in its oversight over the Smithsonian's operations. In that role, we are holding this hearing today to discuss the current plans to renovate the National Air and Space Museum. The National Air and Space Museum consists of two facilities

which are open to the public, the flagship facility, which is located on the National Mall, and the Steven F. Udvar-Hazy Center near Dulles Airport.

The Air and Space's collection truly tells this country's amazing aviation history, and its facilities are some of the most popular. In fact, the Mall facility is one of the most visited museums in the world and with the world's largest collection of historic air and spacecraft among its 63,000 artifacts.

Iconic objects include the 1903 Wright Flyer, Charles Lindbergh's Spirit of St. Louis, Chuck Yeager's Bell X-1, the Apollo 11 Command Module "Columbia," and the Key brothers' airplane from Meridian, Mississippi—thought I would throw that in—which stayed in the air for 27 days without landing, by the way, which perfected aerial refueling in 1935.

Next month, the Air and Space Museum's Mall facility will celebrate its 40th anniversary. With nearly 7 million visitors a year, the museum is the most visited museum in the United States and is one of the world's most popular museums, having received more than 320 million visitors since its opening.

The more than 500,000-square-foot Mall facility was constructed by GSA between 1972 and 1975 at a cost of \$41 million. It includes over 20 exhibit galleries, a planetarium, theater, public observatory, and the popular interactive flight simulators. The facility also includes a restaurant, gift shop, and administrative staff space on the third floor.

Approaching its 40th anniversary this July, the museum's mechanical systems are nearing the end of their useful life. Additionally, the building's original design has led to the cupping of the stones that make up the building's outer stone cladding. The Air and Space Museum's Mall facility is in need of major upgrades and construction repairs. This is the largest revitalization project to date in the Smithsonian's history, with a price tag of more than \$600 million.

The Smithsonian has determined the most cost-effective approach, with the least impact on visitors, is to renovate rather than to demolish and replace the facility. The Smithsonian's proposed revitalization plan will take place over the course of several years, staggering out the overall construction costs and work and allowing visitors to still experience the museum. The Committee has been assured that the museum will remain at least partially open during the renovation and that all of Smithsonian's museums will continue to be free to the public.

The goal of our hearing today is to review whether the Smithsonian Institution's plan for the Air and Space Museum renovation of the Mall facility has been thoroughly developed and vetted, eliminating the need for additional renovations to this specific project in the near future. Congress must be assured that the proposed renovation has taken into account all potential costs, as well as the timing and the value of the work being proposed.

During this hearing, we want to hear from our witnesses if the Smithsonian is considering non-Federal funding sources, such as philanthropic or other potential partnership opportunities, in the event the full appropriations request for the renovation is not met by the Federal Government.

We would also like the Smithsonian to address if it has fully vetted this renovation plan by conducting independent assessments to determine if current cost estimates and proposed timetables are accurate and realistic.

Additionally, we would like to hear from our witnesses on how the addition of proposed storage space located at the Garber facility in Maryland and our other center will tie into this renovation. Legislation H.R. 3702 has been referred to this Committee to authorize the construction of these two storage facilities.

This Committee wants to be supportive of the needs of the Air and Space Museum and ensure that the facility is in a position to have a long and vibrant future. We view this hearing as your opportunity to make the case for funding to the public. There are many competing priorities before Congress today, and our Committee looks forward to hearing your comments on this renovation plan.

Lastly, our Committee appreciates any information our witnesses have regarding the overall state of the Smithsonian Institution, any challenges before you as a whole that we should be aware of, as well as other potential renovation projects on the horizon.

Each of the Smithsonian's entities is cherished by us all, and we feel a personal responsibility to ensure the success of this valued institution and its continued operation for future generations. The Smithsonian is truly one of the great treasures of our Nation and the world, and we look forward to the Institution's continued service.

I thank our witnesses for their appearance before our Committee today, and we look forward to hearing from them on revitalization plans.

I would like now to recognize my colleague, Mr. Vargas, for the purpose of providing an opening statement.

Mr. VARGAS. Thank you very much, Mr. Chairman. I appreciate it.

Mr. Chairman, thank you for holding this important hearing. And welcome to Secretary Skorton, who is making his first appearance, I believe, before this panel, the primary oversight committee in the House for the Smithsonian Institution.

I want to welcome Mr. Horvath also, the Under Secretary of Finance and Administration. Also welcome to you, sir.

I am filling in for our Ranking Member this morning who is delayed in Philadelphia working on making sure we have a successful convention in his district in just a few weeks, so he apologizes. I do understand that Mr. Brady did speak with you yesterday, Mr. Secretary, and I know that he appreciates your appearance here today and is committed to working with you for a successful revitalization of this amazing museum.

This is an exciting year for the Smithsonian. The Museum of African American History and Culture is opening in September with President Barack Obama cutting the ribbon. It seems like only yesterday this Committee reported the authorization bill for that museum, and it was only yesterday, in 2012, that we finally had the groundbreaking.

The passage of time continually requires the Smithsonian to develop new and improved ways to undertake the construction, edu-

cation, collections management, and scientific research activities for which it has been so well acclaimed. And of course, the Institution must always look to preserve and improve the infrastructure, which dates back into the 19th century.

The National Air and Space Museum is one of the Capital's and this Nation's major tourist attractions. It is probably the museum most associated with the Smithsonian by the American people. In 2009, Chairman Brady convened a hearing which focused on public health and safety, worker safety issues related to asbestos abatement in the Air and Space, an important issue given the passage of millions of people through the building's halls every and each year.

It is now critical for our Committee to understand the fiscal implications of this massive new revitalization project, which will keep portions of the museum closed over a period of approximately 6 years. The Air and Space Museum opened with great fanfare in 1976 for the U.S. Bicentennial, but, unfortunately, it was apparently not built the last for the ages.

The need for massive external and internal retrofitting at a time when limited Federal funds are available will place stress on the long list of other priorities which the Institution is pursuing. And seeking funding for both Federal and private, some hard choices obviously are going to have to be made.

I think, Mr. Harper, you did mention that that plane from Mississippi, I believe, was up for 27 days?

Mr. HARPER. Yes, sir.

Mr. VARGAS. It must have been built in San Diego, California, where we have, of course, some fine—that is outstanding. I did not know that. So, again, that is a wonderful fact.

And, Mr. Secretary, Mr. Under Secretary, it is a pleasure to be here.

And I thank Mr. Chairman, again, for the opportunity to say a few words.

Mr. HARPER. Thank you, Mr. Vargas.

Any other Member? Mr. Davis, do you care to make any statement?

I certainly would also like to follow up on that, that Mr. A.D. Hunter was the inventor who designed the shutoff valve for the aerial refueling, which is still used today with just a minor modification at all aerial refueling. So we are excited about that.

I don't know that I would have wanted to have been on that flight because it is a single-engine plane with a metal catwalk on the side of the engine, and somebody had to climb out there during flight and service the engine. So not a lot of fun to do.

But thanks again to our witnesses.

And I would like to also say that our Chairman, Candice Miller, sends her regrets. She certainly planned to be here, but the weather did not accommodate, and she was one of those many who couldn't get into DCA, into Reagan National last night, and is traveling this morning. So she sends her regrets that she could not be here and wishes each of you the best.

I would now like to introduce our witnesses. Dr. David Skorton is the 13th Secretary of the Smithsonian. He assumed his position July 1 of 2015. As Secretary, Dr. Skorton oversees the entire collec-

tion of museums and galleries, libraries, National Zoo, and numerous research centers. Dr. Skorton is responsible for an annual budget of \$1.3 billion, 6,500 employees, and more than 6,300 volunteers.

Before coming to the Smithsonian, Secretary Skorton, who is also a board certified cardiologist, previously was the president of Cornell University, a position he held from July 2006. Secretary Skorton is the first physician to lead the Smithsonian.

Albert Horvath serves as the Under Secretary for Finance and Administration and Chief Financial Officer for the Smithsonian, where he manages administrative offices, including facilities and maintenance, human resources, security, and financial operations. Mr. Horvath did serve as Acting Secretary for 6 months last year following the retirement of then-Secretary Wayne Clough. Before joining the Smithsonian in 2011, Horvath's career spanned more than 30 years in administration at five universities and the Mellon Bank.

Again, we thank both of you for being with us today. The Committee has received your joint written testimony. And the Chair now recognizes Secretary Skorton, and I will recognize him for 5 minutes.

**STATEMENTS OF DR. DAVID J. SKORTON, SECRETARY, SMITHSONIAN INSTITUTION; AND MR. ALBERT G. HORVATH, UNDER SECRETARY FOR FINANCE AND ADMINISTRATION AND CHIEF FINANCIAL OFFICER, SMITHSONIAN INSTITUTION**

**STATEMENT OF DAVID J. SKORTON**

Dr. SKORTON. Thank you, Congressman Harper and Congressman Vargas, for the opportunity and honor to testify before the Committee on House Administration. And Mr. Horvath and I also thank you for the lesson in aviation history that you both just shared with us in a bipartisan fashion. Thank you.

Due to the generous and steadfast support of Congress, the Smithsonian is able to tell our Nation's story in relevant and compelling ways and to inspire the next generations of American scientists, artists, teachers, and leaders.

July 1 marks my first anniversary on becoming Secretary of the Smithsonian. Even though a year has passed, every day I continue to learn more about and become more impressed by the breadth, depth, and the quality of the Smithsonian's work in the arts, humanities, and sciences. Every day I continue to grow more excited by the Smithsonian's enormous potential to engage with the public on some of the most challenging issues we face together as a Nation. Every day, I continue to observe the special bond between the Smithsonian and the American public, how Americans feel ownership and pride in the Smithsonian, and their high expectations for and trust in us. And every day I continue to consider myself privileged to support the dedicated Smithsonian community.

Each year, millions experience the creativity and innovation of our Smithsonian community through exhibitions, scholarly research, public programming, and educational outreach, not only here in Washington but across America and around the world. For

example, more than 600,000 visitors have been captivated with the WONDER exhibition at the newly reopened Renwick Gallery. The gallery itself has become a work of contemporary art and an integral part of an exhibition that has clearly resonated with the public. Since opening in November, WONDER has inspired almost 100,000 social media posts.

And at the National Museum of American History, we are exploring new ways to engage the youngest audiences through wonder of a different sort. The Wegmans Wonderplace is a 1,700-square-foot play area designed to excite the Smithsonian's youngest visitors about American history with novel interactives and objects from the museum's collections. The success of Wonderplace has, however, created one unexpected problem: how we manage parking logistics for dozens of strollers and baby carriages.

Just this past Monday, the Smithsonian Center for Learning and Digital Access launched a digital learning lab that enables teachers and students to find and share more than a million museum resources. We piloted the program in Pittsburgh and Allegheny County, Pennsylvania, public schools. Teachers there told us that the lab's online tools allowed them to build immersive and individualized learning experiences and to share them with other teachers. As one teacher in Moon, Pennsylvania, explained, "It has helped my student and me to think more creatively."

On a more international scale, we are sharing our expertise in collecting and preserving culturally important artifacts with museum and government officials from across the globe. In this regard, the Smithsonian is right now hosting a month-long course entitled "First Aid to Cultural Heritage in Times of Crisis," training participants from 18 nations to anticipate and manage threats to cultural artifacts from war or natural disasters.

Smithsonian staff are also responding to real and immediate crises near and far from home. In Mali, where jihadists destroyed ancient tombs and burned archives, we convened museum directors from across West Africa to share strategies for responding to terror and provided training for crises. In Egypt, we responded, along with the Metropolitan Museum of Art, to bomb-related damage sustained by Cairo's Islamic museum providing quick assessments and counsel. And in Haiti, following the catastrophic earthquake of 2010, the Smithsonian partnered and continues to partner with international organizations and the Haitian Government to rescue, recover, safeguard, and restore cultural artifacts and buildings.

As was mentioned, in less than 100 days, we will open the new National Museum of African American History and Culture. This spectacular building at the foot of the Washington Monument was made possible only through the support of the Congress and thousands of individuals, foundations, churches, and corporations across the U.S. and the world.

As the museum's founding director, Lonnie Bunch explains, the museum will not be one that celebrates Black history solely for Black Americans; rather, we see this history as America's history. The museum will use African American history and culture as a lens into what it means to be an American. I look forward to celebrating with you at the museum's grand opening on September 24.



Today, though, we are here to update you on the Smithsonian's plans to revitalize the National Air and Space Museum, home to some of our most iconic objects and one of the world's most visited museums. Next week, the Air and Space Museum building on the National Mall will turn 40. Congress had appropriated funding in 1971 to construct the museum with a goal of opening during the American Bicentennial.

On July 1, 1976, the museum welcomed its first visitors. While the building was designed to accommodate about 2 million visitors per year, within the first 6 months the 5 millionth visitor was already counted. Now, four decades later, the museum hosts over 7 million visitors annually and has welcomed 326 million visitors since 1976.

The passage of time and the many millions of visitors have taken their toll, and the museum needs a major overhaul. The building's mechanical systems are nearly 40 years old and have exceeded their expected useful lives.

The need for new systems was not unexpected, and for several years the Smithsonian had planned to request funding accordingly. However, in preparing for the system's replacement project, our engineers discovered that many of the building's exterior stone panels were warped or were cracked and that the entire stone facade needed replacement.

Originally, we anticipated that replacing the building's systems would cost approximately \$250 million and be spread over several years. Now, with the added complexity and cost of the exterior stone replacement and the need to protect or relocate more artifacts in the path of construction activities, the current estimate for the building revitalization project is \$676 million.

In March, I testified before the House Appropriations Interior Subcommittee and, reflecting our best knowledge then, noted a construction estimate of approximately \$582 million based on early schematic designs. Since that time, we have reached 35 percent completion of design. We now know much more about the building's condition and the logistics required to protect the collections, and our cost estimate has consequently increased.

Five primary goals underlie our approach to the revitalization project and drive our estimated budget.

First, we want to make as many of the museum's iconic objects accessible to the public as possible during the revitalization project. Americans, especially young Americans, come to Washington and expect to visit the Air and Space Museum. We do not want to disappoint them. But to avoid that, construction will need to be sequenced along zones that would allow for at least 50 percent of the museum to be open to the public while the work progresses. Doing this, however, adds to the complexity and cost of the overall project.

Second, as I have mentioned, we have long recognized that the building's systems, air handling, humidification, plumbing, and electrical, were overtaxed and their useful lives exceeded. Almost 55 percent of the project's total cost will support the installation of new building systems. This is a cross-section of sprinkler pipe from the museum illustrating the state of these critical systems.

Third, early in the design and planning phase, our engineers discovered that the building's marble cladding was warping, cupping, and cracking, creating the danger of individual panel failure and an increasing risk that stone could fall. The stone used when the building was constructed was half the thickness that should have been used. This drives the need to replace rather than repair the stone, an unanticipated increase to the project's scope.

Replacing the stone with an identical or similar material and associated expenses, such as demolition of the old stone, protection of the museum's interior from moisture during construction, the addition of structural reinforcement, and the containment of hazardous material, adds \$101 million, \$49 million of which is for securing the new stone, to the overall construction cost.

Fourth, we intend to transform the 22 galleries in the museum to bring them into the 21st century with more interactive and engaging approaches to sharing the excitement of the museum's incomparable collection. In essence, we are creating a new National Air and Space Museum for the American public. The transformation of the inside of the building will be supported by private contributions that we intend to raise.

And finally, we must store and protect the museum's collection during construction. For fiscal year 2017, we request \$50 million in construction funding to build a new storage module adjacent to the Smithsonian's Udvar-Hazy Center in Chantilly, Virginia. The module's total project cost, including \$8 million already appropriated and committed to engineering, design, and management, is estimated at \$58 million. The cost of the storage module is not included in the estimate for the Mall building revitalization, but is nevertheless critical for the success of the larger revitalization project.

The availability of this quality collection storage space favorably impacts our budget estimate by eliminating the need to rent more short-term collection storage space. And at the conclusion of the project, the module will be used to house artifacts currently stored at aging temporary buildings at the Garber facility in Suitland, Maryland. A bill authorizing construction of this module and an additional storage module at Suitland has been referred to this Committee.

We believe the Air and Space project should be funded by Federal appropriations in the same manner as other major Smithsonian revitalization projects. And, as with the public-private partnerships that made those projects successful, the Smithsonian has committed to raise the additional \$250 million from private sources to transform the museum's 22 galleries to a more imaginative, accessible, and compelling setting for the world's most important aviation and space collection.

Under Secretary Horvath and I would be pleased to answer any questions that you may have, and we thank you again for the opportunity to testify today.

[The joint statement of Dr. Skorton and Mr. Horvath follows:]

Statement of Dr. David J. Skorton, Secretary of the Smithsonian Institution  
On the National Air and Space Museum Revitalization and Collections Storage  
Committee on Administration, U.S. House of Representatives  
June 22, 2016

Thank you Chairman Miller for the opportunity to testify before your committee today. We all appreciate the continued generous support of the Congress and your confidence in the Smithsonian to understand, preserve and tell the story of America and inspire new generations to achieve the American Dream. Your investment in the Smithsonian is an investment in advancing the civic, educational, scientific, and artistic life of our nation.

Since the Smithsonian was established in 1846, we have benefited from a unique and enduring public-private partnership. From care and display of the Star-Spangled Banner to research on the Zika virus, we take our obligation to the American people seriously and leverage Federal appropriations with private support to expand and enhance our reach and capabilities.

Today, at the Committee's invitation, I will focus on our plans for a major revitalization of the National Air and Space Museum's building on the National Mall -- one of the world's most visited museums and a showcase for American achievement and ingenuity. In a single place, the public can view Orville and Wilbur Wright's original 1903 Flyer, the Apollo 11 capsule and a moon rock the mission's astronauts brought back, John Glenn's Mercury Friendship 7 capsule, Amelia Earhart's Lockheed Vega, Robert Goddard's rocket equipment, and the Air Force X-15 that bridged the gap between human flight within the earth's atmosphere and human flight into space.

Before discussing in more detail our plans, I would like to spend a few moments on some general background on the history of the museum beginning just after the close of World War II. In 1946, Congress passed, and President Harry Truman signed, a bill establishing the Smithsonian's National Air Museum to memorialize the development of civil and military aviation; collect, preserve, and display aeronautical equipment; and provide educational material for the study of aviation.

While searching for a permanent location, artifacts were displayed and stored at several locations, including the Smithsonian's Arts and Industries Building. With the advent of the Space Age, Congress expanded the scope of the museum's mission and, in 1966, the name was officially changed to the National Air and Space Museum.

As the nation's bicentennial approached, Congress determined that the museum's building should open in time for the celebration, and in 1971 passed a \$41 million appropriation to construct a new building. Despite that tight deadline, the museum opened its doors on July 1, 1976. Now, four decades later, the National Air and Space Museum on the National Mall hosts over seven million visitors annually.

However, the passage of time and the many millions of visitors have taken their toll, and the museum is in dire need of revitalization. The building's mechanical systems—originally designed to

accommodate two million visitors annually-- are 40 years old and have exceeded their useful lives. New systems are now needed to accommodate continued visitor demands and maintain proper environmental conditions for collections. The need for these new systems was not unexpected and the Smithsonian had planned to request funding accordingly. However, in preparing for the systems replacement project, we discovered that many of the building's exterior stone panels were warped and/or cracked requiring the replacement of the entire stone façade.

We expect that the planning and design phase of the building revitalization project will be completed by July 2017 and we will be able to learn more about the scope of the project and refine the cost estimates as we progress through that. Originally, we anticipated that replacing the building systems would cost approximately \$250 million and be spread over several years. As we've learned more about the condition of the building and the logistics of protecting the collections, our cost estimate has increased. Now, with the added complexity and cost of the exterior stone replacement, the current estimate for the construction portion is \$676 million. This estimate reflects that additional life safety systems need replacement, rather than upgrades, to be code compliant; that the planned mechanical, electrical and plumbing upgrades are more invasive to the building's interior walls and ceiling than anticipated; and that more artifacts will require relocation during construction.

We expect the construction will take six to seven years.

Four key elements are driving our project budget:

**Ensuring Continued Public Access.** First, a major priority during revitalization is to allow public access to as many of the museum's iconic objects as possible. Americans, especially young Americans, come to Washington and expect to visit the National Air and Space Museum and we believe that we must not disappoint them. To achieve that, construction in the museum will be sequenced along seven zones beginning with the west side of the museum and moving east. This approach will allow for at least 50 percent of the museum to be open to the public while the work progresses, but will also add complexity and cost to the overall project.

**Modernizing Failing Building Systems.** Second, we have long recognized that the building's systems --air handling, humidification, plumbing, and electrical -- were overtaxed and their useful lives exceeded. Almost 30 percent of the project's cost will support the installation of new energy efficient building systems which will enable the Smithsonian to meet today's sustainability goals.

**Replacing Defective Exterior Cladding.** Third, early in the design and planning phase, our engineers discovered that the building's marble cladding was warping and cupping. Because the stone is too thin, it cannot be reused. Replacing the stone with an identical or similar material and of an appropriate thickness adds an unanticipated \$49 million to the construction cost.

**Protecting the Collections.** Finally, we must store and protect the museums' collection during construction. In FY 2017, we request additional funding to build the first storage module of a "Dulles Collections Center" adjacent to the museum's Udvar-Hazy Center in Chantilly, Virginia. The construction cost of this module is estimated at \$50 million and is not included in the construction estimate for the Mall building revitalization. That said, the availability of quality collections storage space does positively

impact the construction budget by obviating the need to rent short-term collection storage space. And, at the conclusion of the project, the module will remain in use to house artifacts currently stored at aging “temporary” buildings at the Garber facility in Suitland, Maryland.

The National Air and Space Museum Revitalization Project is the Smithsonian’s most costly to date. We recognize that Federal resources are scarce and in determining the best way forward, we considered many alternatives including simply demolishing the current building and erecting a new one. According to independent experts, however, doing so would both cost more and require the museum to be completely closed to the public for about nine years. It would also require that we conserve and move all the artifacts to alternative storage. The phased approach we selected, allows the museum to protect more than half of the artifacts “in-place,” with only the remainder requiring temporary storage. Moreover, the Smithsonian would lose significant revenue from museum shop, restaurant, theater, planetarium and simulator operations if the museum were closed to the public.

We expect the project to be funded by Federal appropriations in the same manner as other Smithsonian revitalization projects. And, as with the public-private partnerships that made those projects successful, the Smithsonian is committing to raise an additional \$250 million from private sources to support the complete redesign and fabrication of all 22 galleries to be more imaginative, stimulating and technologically capable settings for the world’s foremost aviation and space collection. New exhibitions will have richer content, created to engage visitors of varying ages and backgrounds and to emphasize the importance and relevance of flight to their lives. Among those new exhibitions will be “Destination Moon,” focusing on the Apollo program. The spacesuit of Neil Armstrong, the first human to walk on the Moon, will be encased in a state-of-the-art, environmentally controlled case, which will preserve the fragile artifact, even as millions view it.

I believe that our approach to revitalizing the National Air and Space Museum is further evidence that the Smithsonian is becoming more innovative, nimble, and responsive to the public. We face a future that holds both exciting opportunities and imposing challenges. I am confident that with the continued support of the Congress and the Administration, the Smithsonian will be an even more important, relevant, and unifying presence in an increasing diverse and vibrant America.

Thank you for the opportunity to testify today.

Mr. HARPER. Thank you, Secretary Skorton, for that informative statement.

We will now move into our questions portion, and I will begin by recognizing myself for 5 minutes.

The first question. This project is obviously substantial in both scope and cost. Without getting into the specifics of this one just yet, are there other anticipated renovation projects on the horizon, anything besides this that we are looking at?

Dr. SKORTON. Yes. The Smithsonian, as you mentioned, is in its 170th year, and the visitorship to these museums is breathtaking. We have 28 million visits a year throughout the Smithsonian between Washington, where the vast majority of them are, and New York City, where we have two additional museums. And this very robust visitorship shows the American public's interest in and trust in the institution and a chance to cross those thresholds 364 days a year.

Because of the crush of humanity that goes to these buildings and because of our dedication and commitment to the safety of the public and having them interact and be inspired by constantly changing exhibitions, we do anticipate in years to come that further renovations will be necessary throughout the Smithsonian family.

Mr. HARPER. And if you would, elaborate just briefly on the Smithsonian's deferred maintenance backlog and how this project will impact that.

Dr. SKORTON. I will do the beginning of this answer and ask my colleague, Under Secretary Horvath, if he wishes to add something to it.

The deferred maintenance backlog for the Smithsonian is a very large and daunting figure. And I want to say again and again how much I appreciate and, being new to the Smithsonian, how impressed I am by Congress' very steadfast support of the Smithsonian.

Because of constraints that I would not want to face that you face every day making very difficult choices, we have not been able to keep up with the maintenance of these buildings as would be ideal. And there is nothing surprising about that. With so much square footage and with so many visitors, it would be expected that we would have a backlog of some sort.

What Mr. Horvath and his colleagues and those who manage the facilities of the Smithsonian have done is to prioritize the use of precious Federal funds to those aspects of the deferred maintenance that most affect the public safety and the operability of these buildings.

Nonetheless, we do have a substantial backlog. And our plans are to continue to prioritize the needs based, again, first on public safety and then on the stability of the operations, including, very importantly, protection of the collections. And we hope to continue to make our case to Congress for helping us in whatever fashion you can to deal with the need for continuing upgrades to our very, very heavily used facilities.

Mr. Horvath, would you like to add anything?

Mr. HORVATH. Just to add very quickly, the Air and Space Museum in the context of our overall needs is at the top of our list

of deferred maintenance challenges. It had been programmed in our long-term capital plan for many, many years, and so addressing these issues helped take some of the most problematic challenges off the list. Our challenge continues, though, with the other buildings in our 12 million-square-foot portfolio of buildings.

Mr. HARPER. Thank you.

Secretary Skorton, can you provide the Committee a more detailed explanation of why it is almost twice as expensive to demolish and rebuild the museum rather than renovate the building? And why would rebuilding the museum require it to be closed for 9 years?

Dr. SKORTON. I was very surprised as well when I first came to the Smithsonian and was briefed by Under Secretary Horvath about the comparative cost of the revitalization project versus raising the building and starting over.

Because of the need to protect the collections, we would have to spend enormous amounts of money to rent or build space to house the very, very substantial collections. And in this regard, Congressman Harper, it is not only the number of objects in the collection, but the nature and size of many of the objects in the National Air and Space Museum compared to some other aspects of our 138 million-object overall collections for the Smithsonian. So an enormous cost due do that is one.

In closing the museum for that period of time, we would also lose revenue from some of the retail operations that are in it. And then the other area, which does not line up with a cost, a monetary cost, but would have a cost on the Nation, in my opinion, is keeping people out of that museum for an extended period of time. And, again, because of the need to protect the collection, our estimations were based on the idea that we would have to close the museum for some years.

In designing this project, in my estimation, very skillfully, Mr. Horvath and my predecessors, when he was Secretary and before him, decided to develop this idea of a zoned or phased replacement of different areas that would allow us to keep perhaps 50 percent of the museum open to the public at all times.

And so the combination of the need to spend extra money on collection storage, protection, and management, and the loss of retail revenue and a few other less large factors, all ended up meaning that complete razing and starting it over again was not just a little, but very substantially more than doing it in this fashion.

Would you want to add anything?

Mr. HARPER. Thank you very much.

And I, at this time, I will recognize Mr. Vargas for 5 minutes for questions.

Mr. VARGAS. Thank you very much, Mr. Chair. Appreciate the opportunity.

Again, I want to thank both of you for being here today and testifying before us and, again, for your service. I appreciate it. I know that sometimes it must seem thankless, but believe me, we are thankful for your service.

Could we just continue on that last question just to finish up in my mind. It did seem, to me, odd that we wouldn't, when we are spending that much money, just take the whole building down and

redo it. I mean, it seems to me that that would have been the logical choice if we are spending this amount of money. Because I thought you could maybe organize the museum in a way that is more your liking and more efficient, and it has been around for a long time. But ultimately, you didn't come to that conclusion, obviously, from your testimony. Could you just say a little more about that?

Dr. SKORTON. Yes. I want to emphasize again, and I apologize if I wasn't clear enough in the prepared formal testimony, that this will be a new National Air and Space Museum, even though we are not razing the building and starting from scratch. We will have not only replacement of the important mechanical systems, we will have replacement of life safety systems; we will have a complete new what I would call envelope for the building, roof, cladding, and so on; and very importantly, Congressman Vargas, we will have upgrades of all 22 galleries, in essence, starting over again in our thinking of how to engage the American public.

So as a nonspecialist in facilities, but as a student of facilities development for many years in many earlier assignments, I would say that how Mr. Horvath and my predecessors planned this project was actually a very thoughtful and less expensive way of accomplishing just what you are talking about, and that is basically having a new museum without all of the costs and loss of revenue that would have been involved by completely knocking it down.

And I want to emphasize the public-private partnership nature of our plans, that a quarter of a billion dollars I have committed to raise from philanthropic sources to completely revamp the experience that people will have as they come to the National Air and Space Museum, and then the combination of mechanical systems, life safety systems, and the envelope of the building, will really, in essence, create a new Air and Space Museum.

Mr. VARGAS. Thank you, Doctor.

You know, I live in a historic home, so I am very familiar with the different costs associated with an old building as opposed to just razing it. This one I didn't understand if it was because of the historicity, the nature of the building itself. It hasn't been around that long. I thought maybe that was one of the reasons, but I don't believe that that is. Anyway, I appreciate your comments.

I do want to ask about the stone itself on the outside. So you said that it was only half the thickness that it was supposed to be, so that is why you had the cupping and the breaking. How are we going to be assured that what we are doing now will last beyond what the old stuff has lasted?

Dr. SKORTON. So Under Secretary Horvath and I and all of the thousands of people working at the Smithsonian standing behind us are very, very well aware as American citizens of the enormously difficult choices that you make every day. And we were, I think not dramatic to say, we were shocked in developing the plans to replace the mechanical systems by this issue with the cladding, which was, I believe the Under Secretary would agree with me, completely unanticipated at the time that this was done.

I don't second-guess anybody who was making decisions five decades ago about how to do this. But the decision to cut this stone



thinner than would have been ideal is going to make it impossible for us to reuse the stone, to reuse it, impossible to reuse it.

And so our plan—and it is not just a hope, but a plan—is to make the decisions for this construction project in such a way that our successors will not be coming back to the Committee on House Appropriation to have the very same kind of conversation. We will build this for the long-term and do it in a very thoughtful way, and that is part of the reason that the project cost is so substantial.

Mr. VARGAS. My time is almost over and I apologize. I did want to ask then what do you see as the expected timeline on this building, how long will it be a useful building after this major revitalization?

Dr. SKORTON. Assuming that we can obtain the appropriate funding for ongoing maintenance—it is a very, very important assumption—I believe that this building will have at least a 100-year forward look. But that is very dependent, I must say with respect, on us being able to have sufficient funding to do important maintenance as we go forward.

And would you like to add anything?

Mr. VARGAS. Thank you very much.

Thank you, Mr. Chair. Appreciate it. My time is over.

Mr. HARPER. Thank you.

And Secretary Skorton, we will have you back in 100 years to verify that it lasted after that, if that is okay.

We will now recognize Congressman Davis for any questions that he may have.

Mr. DAVIS. Thank you, Mr. Chairman.

And thank you, Mr. Ranking Member. It is always great to follow those questions.

We should have actually done this at the Air and Space Museum and would have had an enjoyable time.

Thank you for what you do. I mean, obviously, the thousands of visitors just from my district that go through your facilities are always telling great stories. And, as a matter of fact, the Air and Space Museum happens to be my twin boys' favorite. They have been there numerous times, much to the chagrin of my wife, who usually walks there with them.

But we do need to tell the history of our country and the history of our air and space program. My concern is less with what your plans are in the future and more with how are you going to address in today's current environment—you are asking for appropriations from the Federal Government—what if the Federal Government's unable to give you what you think you need to keep the project of this magnitude moving from year to year?

And I want to commend you for the possible private sector investment that you mentioned. Are you going to be able to leverage private sector investment if we are not able to get the appropriations level that you have requested for any given year—and that has happened on other major projects before—or will you take it from other existing revitalization projects?

Dr. SKORTON. We need to have Federal funding of that portion that I mentioned, the 676. And the reason I say that strongly is that I have a very long history of nonprofit fundraising in multiple institutions, and it has been my experience that it is very, very dif-

difficult to raise private funds for replacement of mechanical systems, replacement of an envelope of a building, those sort of things. It is very difficult to do that.

We do intend to raise funds completely from private sources to change the interior of this building and bring it, as I mentioned, into the 21st century. If, as I hope does not happen, in your very difficult decisions it is impossible for us to get the funds that we need, we will do our best to look forward over the period of time to coming back and to making our case in a more convincing way.

But if those eventualities don't occur, and if we are unable to get Federal funding, I believe that the day will come where we will have to begin to reduce the public experience of the National Air and Space Museum. If there are areas that become dangerous to public health and safety, we may have to close those particular areas. And the day may even come where the entire museum would have to be closed to the public if we never have a chance to do this.

Now, that day isn't today; that day isn't tomorrow. And we want to do the project in a thoughtful way over the period of 7 years, including the design phase, as was mentioned.

Mr. DAVIS. I have got a couple more questions, so let me reclaim my time.

Dr. SKORTON. Yes, please.

Mr. DAVIS. Speaking of the hazardous materials, has anybody done a study about the potential of any hazardous materials that could add to the cost or potentially shut the museum down during this renovation?

Dr. SKORTON. Yes, and that is part of the estimate that you already have in front of you.

Mr. DAVIS. That is already part of the estimate, okay.

Dr. SKORTON. Yes.

Mr. DAVIS. One other question I had. I know your retail operations generates some significant revenue. There is nothing like space ice cream back at your hotel. It doesn't really taste as good as the package says it does. I apologize. I hope I don't cut down on your revenue generation by saying that.

How are you going to mitigate the loss of any revenue during this revitalization or renovation process?

Dr. SKORTON. It is a very, very important question, and we are going to do that by judicious use of this phased or zoned project so that we are going to try to maintain as much of the retail operation by careful use of the zoning or phasing.

Mr. DAVIS. All right. Can we actually offer any flavor requests for the space ice cream?

Dr. SKORTON. You can send us requests of any type you like, and I will take the pop flies and Mr. Horvath will take the line drives.

Mr. DAVIS. All right. Hey, again, we do sincerely appreciate what you do. People take for granted the experience that they can get while going to the different Smithsonian museums, a very important part of our Nation's history. Thank you for being here. Thank you for explaining the reason why you have chosen this project—I have your spreadsheet—versus the cost of the new building. We will look into that further. And if I have further questions, I would hope we could be able to get together and ask those.

Dr. SKORTON. Thank you. We are at your service.

Mr. DAVIS. Thank you, sir.

Mr. HARPER. The gentleman yields back.

And I now recognize Congresswoman Comstock for any questions that she may have.

Mrs. COMSTOCK. Thank you, Mr. Chairman.

And thank you for the opportunity to visit. I have been out to the Dulles facility, in particular. Obviously, like my colleagues, I have been to the facility on the Mall. But I particularly appreciate the Dulles facility in my district. And I certainly did see from the presentation, the visit we had there, the challenges that you have with the storage. And I know the storms over the years have taken their toll on the facilities to where some of the buildings are literally falling down. If you haven't seen it, it really is a problem.

And then you have some very historic planes and space items that are in a precarious situation, and if we lose them, we lose that history forever.

So I do appreciate the difficulty of the challenge. And if folks haven't been out to the Dulles facility, what is particularly great is to see the work being done right there and seeing all the complex programs you have.

And so I wanted to ask—first, thank you for all the good work that you are doing there. Are there naming opportunities or things there from the aerospace industry where they can—I mean, obviously, as you do the private fundraising, they will, I assume, probably be a target for the fundraising, and, obviously, people are very interested in preserving that history that they are very much a part of. But are there naming opportunities there throughout the facilities where we can use that in some kind of respectful way that works with the overall mission?

Dr. SKORTON. Yes, there definitely are. And the fact that the facility in Chantilly is called the Udvar-Hazy Center is a very good example of that. In pursuing the success of the goal of \$250 million to transform the 22 galleries, we will look very judiciously at those opportunities as well.

And if I might offer just a comment, still as a relative newcomer to the Smithsonian, I believe there is a beautiful balance and synergy between Congress' steadfast support and the ability to raise private funds. I think people in the public are more likely to give philanthropically if they see that this is a congressional priority. And at the same time, I would assume that our ability to raise private funds, making this truly a public-private partnership, will make it more likely that you see us as very careful stewards of the precious funds that you give us.

So, yes, there will be opportunities. And my colleagues, especially General Dailey, is already looking into some of those options.

Mrs. COMSTOCK. And is there anything that we in Congress are doing that holds back those opportunities? I know we always run into ethics things about how we can sort of legally promote and help in any of these ways. And so are there ways that we are holding you back in any way that we might need to know about so that you can advance those?

Dr. SKORTON. No. I think you do an enormously, enormously effective job of two very important things: that you are very generous with us, and at the same time, you help us maintain the very high-

est ethical standards. Because the currency that allows us to be what the American public wants us to be is our integrity, and you help us very much every day to maintain our integrity as we assertively try to raise funds in every fashion that we can. So I have nothing but praise and gratitude for the Congress throughout these areas.

Mrs. COMSTOCK. And I should know, but what is the ability to use the facility for private events, for people to come in, to hold events, again, that you can charge for obviously? And how is that utilized? And is there some more opportunity there, whether it is overnights at the museum or things? I mean, are we able to do those in a way that is profitable for you?

Dr. SKORTON. We do have a very well-developed system of doing that. And if it would be acceptable to you and to the Chairman, what I could do is get that policy to you to explain how we handle that situation. But we do that in a very robust way throughout the Smithsonian family. And I am very happy, if you would like, for us to give you details.

Mrs. COMSTOCK. Okay. And I know you do have good advertising at Dulles Airport. When you are riding around, you get information on visiting there. But I have been bugging our local airport, Dulles, to do more advertising and promotion there. So if there are video opportunities, more signage, because Dulles is so huge and big and they need to be advertising a lot of the local things that are going on, so if that is an area where it might help drive more traffic there as well as more support, corporate support as people come in and see that, I think that might be another way we can be promoting and protecting your efforts there.

Dr. SKORTON. Thank you.

Mrs. COMSTOCK. So let me know if we can—whatever we are legally allowed to do, I would be happy, and really do appreciate the good work that you are doing there.

Dr. SKORTON. Thank you very much. I think that is a very interesting idea. I personally will follow up on that after the hearing. Thank you very much.

Mrs. COMSTOCK. And I yield back, Mr. Chairman.

Mr. HARPER. The gentlelady yields back.

One final question, if I may ask. You had said earlier that 35 percent of design completion had been achieved. Was that correct on what your answer was?

Dr. SKORTON. Yes, sir.

Mr. HARPER. And when will we get to 100 percent of design completion? And what might we anticipate on the effect that would have on projected cost?

Dr. SKORTON. Thank you. I am going to turn in a moment to the Under Secretary to tell you the exact date for 100 percent completion. But anticipating the question, I went back and looked at our track record of predictability once we get to the 35 percent design level, and I found that in about half the cases I looked at we ended up a bit above budget and about half the cases we ended up a bit below budget, in general, within about 10 percent of that 35 percent prediction.

And where it exceeded in a substantial way, it usually was because of some change in the scope of the project. So I am much

more confident at the 35 percent, that we are somewhere, let's say, 90 percent certainty that this is where we will end up.

And, Under Secretary, can you remind us the date of 100 percent completion?

Mr. HORVATH. It will be about a year from now. The next big milestone will be at the end of this calendar year when we expect to hit 65 percent completion and then virtual completion of design would be the summer of 2017.

Mr. HARPER. And if you could, when you hit that 65 percent mark, if you could inform us of any changes in that cost estimate, that would be helpful.

Mr. HORVATH. Certainly.

Mr. HARPER. You know, as we look at the prioritization and the costs that we have, one of the concerns, obviously, is how we take care of this deferred maintenance, how we address those issues and prioritize them, how we come up with the right funding. But at the heart of this, what the Smithsonian means to Americans and to our visitors. It is our goal to always keep this free for admission, where people can come and enjoy this, regardless large school groups or families, always keep this open.

You have a great team. You should be thankful for that and for all the support they have.

Without objection, all Members will have 5 legislative days to submit to the chair additional written questions for the witnesses, which we will forward. And I ask the witnesses to respond as promptly as they can so their answers may be made a part of the record.

**Questions for the Record on the House Administration's June 22, 2016 hearing on the Smithsonian National Air and Space Museum (NASM) Revitalization**

- 1. Can you provide the Committee a more detailed explanation of why it is almost twice as expensive to demolish and rebuild the museum rather than renovate the building? Why would rebuilding require the museum to be closed for nine years?**

The Smithsonian contracted with Jacobs Project Management Company to perform several independent analyses (outside of the renovation design effort) on the NASM Revitalization Project. Their February 2016 *Risk Analysis Report* addressed specific aspects of the Replacement Museum Scenario and was updated by the Smithsonian to include the most recent revitalization cost projections (Attachment 1).

Constructing new, based on recent cost-per-square foot averages for museums in the area, is significantly higher than revitalization, mostly due to costs for excavation, foundations, and structural infrastructure. The revitalization scenario reuses the existing building's foundations, structural steel frame, and many of the Museum's internal partitions, stairwells, elevators and chaseways. In addition, it would be necessary to provide storage and swing space for the entire contents of the existing building. We estimated that, for collections, approximately 290,000 gross square feet (gsf) of collections storage space would be necessary, including high-bay space for the large aircraft and rockets. Storage facilities of this size that satisfy the artifacts' climate control requirements are not typically available in the commercial marketplace. Leasing large, high-bay space and then retrofitting it to provide collections-quality environmental, safety and security conditions, or building new space to suit the artifacts, is both a significant cost and time component of the Building Replacement scenario. Furthermore, the effort required to relocate all artifacts to swing space for the duration of demolition and new construction, and then to reinstall them in a new museum, is a very significant cost and schedule driver. Both the acquisition/outfitting of collections swing space and the move of collections out and then back into the building result in estimates for these cost categories that are two to three times greater for the Replacement Building scenario than for the Revitalization scenario.

Likewise, the schedule estimated to execute the Replacement Building scenario (Attachment 1), requires extending the amount of time that the Museum would be closed to the public. A new building would be ready and open by March 2030, the assumption being a decision to move forward with a new building is made by October 2016. The Museum would be closed for nine years, starting in April 2021. Out of the nine years, five would be needed for demo and construction, with two years of exhibit/artifact de-installation on the front end (prior to demo) and two years for exhibit/artifact installation on the back end before a newly constructed building and exhibitions could open to the public.

- 2. The Udvar-Hazy facility at Dulles, which opened in 2003, is a spectacular addition to the Air and Space Museum. Did you consider relocating the entire Air and Space museum to this location rather than pursue renovation of the Mall museum? Did you consider any other alternative locations?**

The Udvar-Hazy facility is indeed a spectacular addition to the National Air and Space Museum and it houses many artifacts that are too large to display downtown. However, some of the most historic accomplishments in aviation and space and in particular American contributions to humanity's achievements in flight are celebrated in the iconic Museum on the National Mall, opened during this

country's Bicentennial. The National Mall attracts millions of visitors each year. Having these historic artifacts on the Mall provides the public with unprecedented access to these national treasures.

Rebuilding the National Air and Space Museum on another site was not considered. We agree with Public Law 85-935 that located this seminal Museum and cultural icon dedicated to aviation and space on the National Mall. Consolidating the NASM collection in the Udvar-Hazy Center (UHC) as a single museum building was also not considered. Without significant expansion at UHC, most artifacts currently on public display would have to go into storage. We respect the decisions and efforts of the past generation to select a prominent location on the National Mall to celebrate humanity's achievements in flight. The overwhelming popularity and continuing success of the National Air and Space Museum on the Mall and its UHC extension demonstrate that public access to these collections and programs is valued and cherished by American and global audiences.

3. **Please provide a more detailed breakdown of the Current Working Estimate. Of the \$469 million allocated for the construction bid amount, how much is allocated for the mechanical systems and the outer envelope?**

The breakdown of both the total project costs as well as the anticipated construction bid amounts are illustrated in the attached charts (see Attachment 2). Without the indirect mark-ups and associated design costs, the mechanical, electrical, and plumbing portions of the revitalization represent about 40 percent of the total construction estimate. The exterior envelope revitalization, including the entire replacement of the stone cladding assembly, the glazed curtainwall, and the roofing and skylights, represents about 23 percent of the total construction estimate.

4. **As planned, the project will commence without full funding as you intend to seek federal appropriations over several years. What is the impact if full funding is not provided or is delayed? Is the project sequenced in such a way that it can be delayed or halted until funding is available – while keeping the museum open to the public?**

Failure to complete the revitalization according to a reasonably sequenced and phased zone approach could at some point force us to close the Museum in its entirety due to an inability to maintain either the partially installed permanent or temporary integrity of the exterior envelope and internal building environmental systems. The phased revitalization by zones must be implemented sequentially (interior and exterior in tandem) and without intermittent delays in order to achieve efficient cost, schedule, and quality control as well as to reduce safety risks to visitors, staff, and collections. Funding delays will impact schedule and cost by requiring extensive temporary environmental systems and safety barriers, and by prolonging the time frame before the Museum's replacement HVAC system can be balanced and commissioned throughout the building.

As on any large-scale construction project, even with our standard Federal Acquisition Regulations termination for convenience clauses, early termination due to lack of funding creates tremendous risk to the Smithsonian as a whole, the NASM Mall program, and contracted construction vendors. In particular, this project carries unusual risk associated with the purchase of cladding materials as a long-lead item. Failure to follow through on the project once that purchase is made would result in significant waste or spoilage, including the risk of exposing artifacts to detrimental conditions.

5. **Recently, the Air and Space Museum initiated their first-ever “Kickstarter” campaign to raise funds for the preservation of Neil Armstrong’s suit and it was quite successful. Are there additional creative ways to raise funds for this project? For example, have you considered selling or auctioning any items in the collection that may no longer be considered essential?**

The Air and Space Museum is committed to raising \$250 million for the transforming of all 22 of its galleries and is developing a campaign specifically to support that effort. We recognize this is an ambitious goal and plan to consider every approach, especially those already proven successful, such as crowd-sourcing for the care and exhibition of iconic objects. We would not, however, consider selling collections objects to fund operations or capital improvements. Our position reflects best ethical practices for museums, applicable non-profit accounting practices set by the Financial Accounting Standards Board (FASB), and the expectations underlying many of the objects donated to our Museum. We follow the Alliance of American Museum’s (AAM) code of ethics provisions that prohibit museums from using the proceeds from the sale of collection objects “for anything other than acquisition or direct care of the collections.” For example, the Smithsonian’s National Postal Museum deaccessioned a series of duplicate revenue stamps over a period of time in the mid-2000s, and used the proceeds to purchase stamps to complete, and to support the direct care of, the National Collections. With regard to the Air and Space collections, many of the objects were transferred directly from the National Aeronautics and Space Administration (NASA) with the understanding that, if deaccessioned, objects would be transferred to other museums and educational institutions across America.

6. **Do you plan on having any third-party risk assessments performed for the project construction, in order to evaluate cost and schedule compliance?**

Yes, we plan on having third-party risk assessments performed for the project construction, including a rigorous risk assessment protocol based on Government Accountability Office (GAO) best practices.

7. **What controls will you put in place to ensure the construction is completed on time, on (or under) budget, and as specified?**

In addition to the Risk Assessment process described above, the Smithsonian will support the NASM Revitalization (as we have on all our large projects) with a dedicated, on-site team of skilled in-house and contracted construction-management, scheduling, and inspection staff. The Architect-Engineer contract also provides for construction phase review and on-site observation. In addition, a third-party auditor will support the project during the construction phase by reviewing construction contract and sub-contract costs and schedules.

8. **What type of acquisition strategy do you plan on utilizing for the construction of the project and how will it be structured to minimize schedule and cost risk?**

Following the guidance in the Federal Acquisition Regulations (FAR) for best-value procurements, the Smithsonian will select a Construction Manager as Constructor (also known as Construction Manager at Risk). The Request-for-Qualifications (RFQ) yielded four qualified Construction Contractor teams which are currently being evaluated before a Request for Proposal (RFP) is issued. In addition to standard federal termination for convenience provisions, we have incorporated provisions on incremental funding and a risk register to identify specific issues of concern to staff involved on the project.



**9. Have any studies or facility condition assessments been performed in order to determine the condition of all building systems and extent of existing hazardous materials?**

Yes. Several assessments and studies were completed during the pre-project planning phase of this project, including ongoing Facility Condition Assessments (which are conducted every three years), periodic Hazardous Materials Surveys, the 2013 Comprehensive NASM Master Plan (with its Existing Conditions study), the 2014 NASM Revitalization Feasibility Study (which included both Sustainability and Envelope studies and visual verification of the hazardous materials survey), the 2015–2016 Stone Feasibility Study, and the 2015–2016 Integrated Cost-Schedule Risk Analysis.

**10. What steps have you taken to evaluate security risks and improve security posture with the renovation? Do you coordinate with Department of Homeland Security to ensure all security requirements are met?**

The safety of the public and our staff and volunteers is of the highest priority to the Smithsonian. Therefore, we regularly assesses risk at all of our facilities, to include NASM. These assessments include measuring compliance with the Interagency Security Committee's (ISC) federal facility security and standards. The ISC is managed and chaired by the Department of Homeland Security.

Those risk assessments and compliance reviews have revealed several mitigation measures that can reduce the risks at NASM, and we have taken the opportunity to incorporate many of them in the renovation project. Such measures as increased blast resistance, improved electronic security, and mass notification will be included. Additionally, new vestibules to move the security screening out of the main facility are included in the project. This will both improve the visitor experience and enhance the facility security.

**11. The museum is one of the most-visited in the world. School groups and others may plan years in advance to visit the museum. What are your plans for communicating with the public about the renovation project and the impact on visiting the museum?**

As Secretary Skorton noted in his testimony, we recognize that Americans, especially young Americans, come to Washington and expect to visit the National Air and Space Museum and that we do not want to disappoint them. To do that, construction will be sequenced along "zones" allowing for at least 50 percent of the Museum to be open to the public while the work is done. At various times, specific exhibitions and galleries will be closed — these changes will be publicized through the media, advertising, the Museum's website (which many visitors check in advance), and social media. Group reservations are not required at either Air and Space Museum location; the great majority of tour groups are "walk-in" groups without reservations. Although some school groups do attend pre-scheduled programs, we anticipate being able to accommodate these groups without upsetting expectations.

**12. The Smithsonian's collections number over 137 million diverse items. Artifacts are continually added which increases pressure for additional storage facilities. Do you collect items you cannot appropriately store at the time of accessioning? Do you have a process of "de-accessioning" items from the collection? What percentage of your collections is "de-accessioned" each year?**

The Smithsonian has never considered collections to be static. Collections must and do continually grow to support our mission and programmatic goals. Ever-evolving collections ensure the ability of the

Smithsonian to tell and share our nation's continuing story in all of its dimensions — across history, art, science, and culture. They contribute to global innovation and document the world's forever changing cultural and scientific heritage, enabling researchers to address such challenges of the 21st century as the effects of global change, the spread of invasive species, and the loss of biological diversity and its impact on global ecosystems and cultures. In some cases, we have a congressional mandate to collect objects, beginning with our enabling legislation that clearly calls for the transfer of collections belonging to the United States to the Smithsonian. More recently, Congress designated the National Museum of American History (NMAH) as the official repository for September 11 materials. Another form of mandate comes in congressional authorizations to build new museums, such as the National Museum of African History and Culture, which has collected more than 34,000 objects requiring additional collections storage space.

Planning for future collections growth and the anticipated storage needs is a challenge, and sometimes nearly impossible, because each collection is unique, past growth does not always indicate future growth rates, and acquisitions often occur in surges rather than at a steady rate. Unpredictable patterns of growth often occur because of history-making events that need to be documented, such as the decommissioning of the Space Shuttle program, as well as unique collecting opportunities and development of new collecting initiatives. Collections also vary in size and type — from the smallest insect to the Space Shuttle, from paintings to frozen tissue specimens — profoundly affecting collections space requirements. Unanticipated acquisitions have often contributed to overcrowded collections storage conditions and reliance on leased collections space. In order to provide responsible stewardship of the collections, potential acquisitions undergo a rigorous selection and review process with stringent evaluation criteria, including our ability to provide appropriate management, long-term preservation, and suitable storage. Because of this rigorous selection process, the Institution acquires only a small percentage of what is offered to the Smithsonian.

Deaccessioning and disposal of collections are a legitimate part of Smithsonian collections stewardship. Prudent collections management includes judicious consideration of appropriate deaccessioning to refine and improve the quality and relevance of the collections with respect to our mission, purpose, and current programmatic goals. Our deaccession and disposal procedures are designed to ensure thoughtful, well-documented consideration of each proposed collection item in the long-term interest of the Smithsonian, the general public, and the collection item itself. Collections are deaccessioned and disposed of only in accordance with established authorities, procedures, and when consistent with all applicable laws, regulations, professional ethics, and restrictions. Similar to acquisitions, the deaccession and disposal of collections vary from year to year. During the past 20 years, the Smithsonian has deaccessioned an average of approximately 21,000 collection items each year, with the exception of two large deaccessions of 7.4 million revenue stamps in 2004 and 4.1 million plankton specimens in 2015 by the National Postal Museum and National Museum of Natural History, respectively.

**13. Past IG reports have identified as much as 47 percent of collection storage space as unacceptable. How will the addition of the two proposed storage facilities impact that number?**

In FY 2015, the Smithsonian completed a multi-year, Institution-wide collections space planning initiative that included a first-of-its kind survey of existing collections space conditions and resulted in a Collections Space Framework Plan with a 30-year implementation plan. This plan addresses current and projected Institution-wide collections space requirements in a pragmatic, strategic, and integrated manner. The past IG report referred to the results of the Framework Plan and existing collections space survey. The Plan identified 34 percent optimal space, 19 percent acceptable space, and 47 percent unacceptable space based on Smithsonian-developed collections space standards — with the Garber Facility as having 33 percent of the Smithsonian’s unacceptable collections space. The IG also stated that the Framework Plan, if funded, would enable the Smithsonian to renovate nearly 700,000 square feet of existing unacceptable space and add 1 million square feet of new space to relieve overcrowded collections space conditions, replace space that cannot be improved through renovation, and address future collections space needs.

The addition of the two proposed storage facilities would reduce the unacceptable space by 14 percent, or approximately 126,000 square feet. This includes approximately 8 percent (about 73,000 square feet) for the new Dulles Collections Storage Module from collections currently housed in six substandard buildings at the Paul E. Garber Facility in Suitland, Maryland. It also includes 6 percent (about 53,000 square feet) for the new Pod 6 at the Museum Support Center from collections now housed in four substandard buildings at the Garber Facility and several Mall museum locations. Construction of Pod 6 is also necessary to maintain the critical path for the NMAH East Wing public renewal project, which requires both temporary and permanent relocation of a significant volume of collections from the Mall building to accomplish the renovation. The construction of the NASM storage module and Pod 6 will both provide essential temporary swing space required during the NASM and NMAH building renovations, reducing lease costs and permanent storage for the relocation of at-risk collections from unacceptable storage spaces at the Garber Facility and on the Mall, as well as enable the phased redevelopment of the Garber campus.

**14. The Secretary stated in his testimony that planning and design are expected to be completed by July 2017, at which time the Smithsonian “will be able to learn more about the scope of the project and refine the cost estimates.” But already costs have increased from an original estimate of approximately \$250 million, and the “Current Working Estimate” of \$582 million increased last month to \$676 million. Is there a cost ceiling on the project?**

The \$250 million estimate represented an early, rough-order-of-magnitude cost based on a project scope consisting of HVAC system replacement and exterior envelope repairs, prior to completion of any of the Revitalization Feasibility Studies. The project estimate of \$582 million was based on a schematic level of design development for the building envelope and systems replacement scope, recognition of the need for improved security at the building entrances, more detailed examination of structural conditions, and life-cycle cost analyses of various mechanical systems. We had not yet completed a detailed artifact protection and relocation logistics plan nor completed a comprehensive incorporation of code compliance, energy efficiency, and greenhouse gas-reduction requirements, including the March 2015 Executive Order 13693, “Planning for Federal Sustainability in the Next Decade.” Some of the cost increase in the mechanical, electrical, and plumbing system components reflects design decisions based on life-cycle and operational considerations, where somewhat higher capital first costs are offset by longer-term savings in energy, water, and maintenance costs. The energy analysis

estimates a 49.3 percent reduction in source energy usage and a 55.4 percent reduction in CO<sub>2</sub> emissions. The projected reduction in utility costs is 24.5 percent.

The \$676 million estimate now reflects our advancement of all components of the project to the 35 percent design development level and a thorough reconciliation of two, independently prepared cost estimates. Estimates produced before the 35 percent design development stage are based on incomplete investigations and undeveloped solutions. The 35 percent design milestone typically represents the point at which we have aligned the known project scope with validated cost estimates, identified and assigned appropriate contingency values and mitigation strategies to anticipated remaining risks, and settled the project budget. Our track record on major projects in recent years demonstrates that the 35 percent reconciled cost estimate is generally accurate within 10 percent either above or below the actual construction award amount. The projects that exceed that difference have had scope added to the project between the 35 percent design development stage and 100 percent design completion to address changed mission requirements or expanded project boundaries.

We expect our current working estimate to remain the basis of our final approved scope, schedule, and budget. Significant changes to the anticipated schedule due to funding availability will have corresponding impacts on the cost because of potential contract termination, suspension and/or escalation. The Smithsonian is continuing its risk assessment protocol based on GAO best practices and will continue to monitor and mitigate risks throughout the remainder of the design and construction phases.

- 15. If legislation authorizing the proposed new swing space at the Udvar-Hazy Center in Virginia has not been enacted into law, or has not been fully funded, or if the project has not been completed by the time revitalization is supposed to start in 2018 and exhibits are supposed to be moved there, what will happen? Could revitalization at Air and Space be delayed? Would the Smithsonian have to rent space temporarily? If so, where, and what are the likely costs?**

If the Dulles Storage Module 1 project is delayed for any reason, the NASM Revitalization project will also be delayed. The construction activities in gallery spaces cannot start until there is swing space available to receive artifacts that must be relocated during the Revitalization project. Renting temporary space is unlikely due to the requirement for an appropriately conditioned environment for artifacts. Environmentally controlled and secure space (temperature/humidity) for artifacts is not readily available in the marketplace. A space large enough for these artifacts would need to be located, acquired through lease negotiations, and then outfitted with collections-quality mechanical, electrical, fire protection and security systems. We have not located potential space of the necessary size and high-bay capacity. However, based on the Smithsonian lease and build-out of the Pennsy Drive collections storage facility, we have estimated that an annual lease cost, with collections-quality environmental fit-out amortized over the length of the lease period (nine years), would be in the range of \$44/sf at the midpoint of the project. For an approximate 124,452 gsf of acceptable storage space (the size provided by Module 1 proposed to be constructed adjacent to the Udvar-Hazy Center), the annual average lease cost would be in the range of \$5.5 million, costing the Smithsonian more than \$50 million in rent payments alone for the anticipated duration. This is higher than the expected construction bid estimate (\$44 million) for the new Dulles Module 1, which will become the permanent home of NASM artifacts moving out of the Garber buildings in Suitland after it serves its purpose as swing space for the NASM Mall Building Revitalization. Therefore, leasing this type of space is not a viable option because the costs would be prohibitive.

**16. Will there be any new admission charges to Air and Space at any time while the revitalization project in the Museum is underway, or could the project lead to admission charges there when it is completed?**

The Smithsonian remains committed to making its museums as accessible to as many Americans as possible. With that in mind, we do not plan to charge any admission fees during, or as a result of, the National Air and Space Museum's revitalization.

**17. What kinds of new, innovative or more cost-effective building technologies and design features might be employed by the Smithsonian during the revitalization?**

The major focus of design was to address all the systems that are in need of replacement by incorporating the latest available technologies to significantly improve their efficiency and sustainability. Everything from the components for the building enclosure, to the HVAC and control systems, to fire and emergency management systems, to solar-powered, photovoltaic panels and the latest storm-water recycling system elements are included in the plans. Insulated metal composite panels behind the cladding system will serve as the primary barrier against the elements and maintain the interior environmental conditions, as well as simultaneously contribute to blast-protection requirements — an efficient application of the latest building component technologies. The use of photovoltaic panels on the roof will provide approximately 10 percent of the building's power needs. The latest computer control technology will be implemented for the HVAC system to help deliver the required interior ambient conditions for a museum environment, and will also use heat-recapture capabilities to further energy efficiency.

In addition, the gallery redesign follows a "black box" strategy that reduces dependence on customized infrastructure for each individual gallery and affords greater flexibility for future exhibit updates and reconfigurations. All of the galleries will be supplied with fiber-optic backbones, data pathways and connection points to make them compatible with the inevitable rapid advances in digital and interactive displays.

**18. Taking into account the experience with GSA in the design and construction and subsequent deterioration of the Air and Space Museum, what role does GSA currently play in any Smithsonian design or construction-related activities?**

In general, GSA does not have any specific role in Smithsonian design or construction-related activities. GSA has a landlord role in two facilities where the Smithsonian has program space: the Heye Center for the National Museum of the American Indian in New York City (within GSA's Alexander Hamilton U.S. Custom House) and the National Postal Museum within the United States Postal Service's historic post office building near Union Station in Washington, DC. Space modifications in these facilities are reviewed and approved by GSA. In addition, GSA provides both chilled water and steam to several Smithsonian buildings on and near the Mall. For the current NASM revitalization project, we have consulted and collaborated with GSA on energy studies and workplace office layout strategies.

**National Air and Space Museum Replacement and Revitalization Project Cost Comparisons**

| <b>Building Cost Categories</b>                        | <b>Building Replacement*</b> | <b>Building Revitalization</b> |
|--|------------------------------|--------------------------------|
| Construction <sup>1/2</sup>                            | \$1,014,585,000              | \$469,000,000                  |
| Design, Commissioning, Construction Admin <sup>3</sup> | \$249,587,910                | \$90,995,000                   |
| Design & Construction Contingency                      | \$243,500,400                | \$70,350,000                   |
| Staff Swing Space Lease & Fit-out                      | \$20,040,000                 | \$11,890,000                   |
| Move Collection Objects <sup>4/ 5</sup>                | \$67,600,000                 | \$33,800,000                   |
| <b>Sub-total</b>                                       | <b>\$1,549,913,310</b>       | <b>\$676,035,000</b>           |
| <b>Other Costs</b>                                     |                              |                                |
| Cost of Redirection <sup>6</sup>                       | \$13,557,835                 |                                |
| Artifact and Exhibit Storage <sup>7/8</sup>            | \$160,677,307                | \$58,704,000                   |
| Gallery Fit-out (Privately Funded)                     | \$250,000,000                | \$250,000,000                  |
| Lost Operating Income                                  | \$131,731,714                | \$42,551,000                   |
| <b>Sub-total</b>                                       | <b>\$555,966,856</b>         | <b>\$351,255,000</b>           |
| <b>Total ROM Program Cost</b>                          | <b>\$2,151,280,166</b>       | <b>\$1,027,290,000</b>         |

\* Building replacement construction cost is based on recent museum projects in the Washington, DC area: two Smithsonian projects (National Museum of the American Indian and National Museum of African American History and Culture) and the US Marine Corps and National Law Enforcement Museums. The actual cost per square foot for each was adjusted for location and escalation from the project's construction completion to an estimated start of construction for a replacement NASM building in FY 2024. The escalated cost per square foot for new museum construction in the Washington, DC area averages \$1,401 per gross square foot (GSF).

<sup>1</sup> Building Replacement: Includes demolition of existing NASM building with hazmat abatement at \$18/GSF and replacement of a nominal 715,000 gross-square-foot NASM building [715,000 GSF X \$1,419 = \$1,014,585,000].

<sup>2</sup> Building Revitalization Scope: Building envelope and systems; 3rd floor and basement reconfiguration; terrace revitalization; and vestibules.

<sup>3</sup> Budgeted costs other than construction: Includes design, commissioning, engineering during construction, construction supervision and administration, security, and miscellaneous costs.

<sup>4</sup> Building Replacement: Entire collections move to and from off-site storage; estimated at approx. 2 to 3 times the cost of relocating only artifacts in the path of construction activities in the Building Revitalization scenario.

<sup>5</sup> Building Revitalization: Combination of on-site protection and sequential moves to and from off-site storage.

<sup>6</sup> Feasibility study and design (through schematics) funds expensed on Revitalization project to date ("sunk costs").

<sup>7</sup> Building Replacement: Cost of building Dulles Collections Center (DCC) Storage Modules 1, 2, and 3 to accommodate the storage of all collections (approx. total of 290,000 gross square feet of space).

<sup>8</sup> Building Revitalization: Total project budget of DCC Storage Module 1 (including planning, design, construction, administration, and other project costs).

**NASM Replacement Building Scenario Estimated Time Frames:**

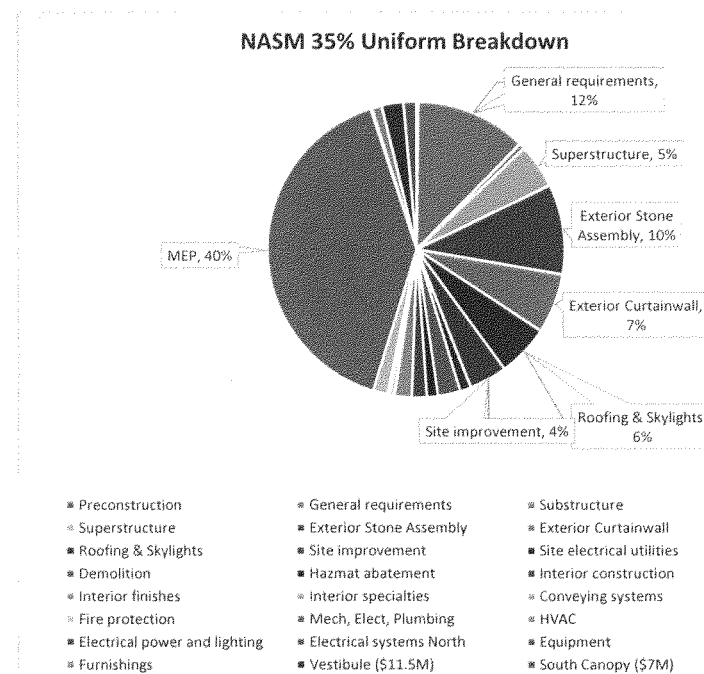
| <b>Timeline of Building Replacement Scenario Activities</b>   |                           |                   |
|---|---------------------------|-------------------|
| <b>Activities</b>   | <b>Projected Duration</b> | <b>Period</b>     |
| Design & Build DCC Storage Module 1   | 3.5 Years                 | Jan '15 – Jun '18 |
| Federal Approvals (National Environmental Policy Act/<br>Environmental Impact Statement) & Programming/Pre-design | 2.5 Years                 | Oct '16 – Mar '19 |
| Design & Build DCC Storage Module 2 & Hangar  | 3.5 Years                 | Apr '19 – Sep '22 |
| Design Replacement NASM   | 4.5 Years                 | Apr '19 – Sep '23 |
| De-install Museum   | 2 Years                   | Apr '21 – Mar '23 |
| Staff Swing Space   | 6 Years                   | Oct '22 – Sep '28 |
| Demo Existing NASM  | 1 Year                    | Apr '23 – Mar '24 |
| Construct Replacement NASM  | 4 Years                   | Apr '24 – Mar '28 |
| Re-install Exhibits   | 2 Years                   | Apr '28 – Mar '30 |
| Museum Closed to Public   | 9 Years                   | Apr '21 – Mar '30 |

**NASM Revitalization Construction Estimate**

Based on 35% reconciled estimate with prelim VE reductions

|                                  |           |                    |          |
|----------------------------------|-----------|--------------------|----------|
| Preconstruction                  | \$        | 1,000,000          |          |
| General requirements             | \$        | 50,518,617         |          |
| Substructure                     | \$        | 3,173,293          |          |
| Superstructure                   | \$        | 24,001,987         |          |
| Exterior Stone Assembly          | \$        | 48,715,522         |          |
| Exterior Curtainwall             | \$        | 24,947,779         |          |
| Roofing & Skylights              | \$        | 27,262,603         |          |
| Site improvement                 | \$        | 20,468,901         |          |
| Site electrical utilities        | \$        | 5,802,005          |          |
| Demolition                       | \$        | 12,311,473         |          |
| Hazmat abatement                 | \$        | 5,907,757          |          |
| Interior construction            | \$        | 7,994,322          |          |
| Interior finishes                | \$        | 9,399,747          |          |
| Interior specialties             | \$        | 2,088,907          |          |
| Conveying systems                | \$        | 1,151,337          |          |
| Fire protection                  | \$        | 8,248,802          |          |
| Mechanical, Electrical, Plumbing | \$        | 198,376,318        |          |
| HVAC                             |           | -                  | included |
| Electrical power and lighting    |           | -                  | included |
| Electrical systems               |           | -                  | included |
| Equipment                        | \$        | 718,611            |          |
| Furnishings                      | \$        | 5,431,451          |          |
| New North Security Vestibule     | \$        | 11,521,391         |          |
| South Canopy                     | \$        | -                  |          |
| <b>TOTAL</b>                     | <b>\$</b> | <b>469,040,823</b> |          |

cost/gsf = \$ 777  
cost/gsm = \$ 8,365



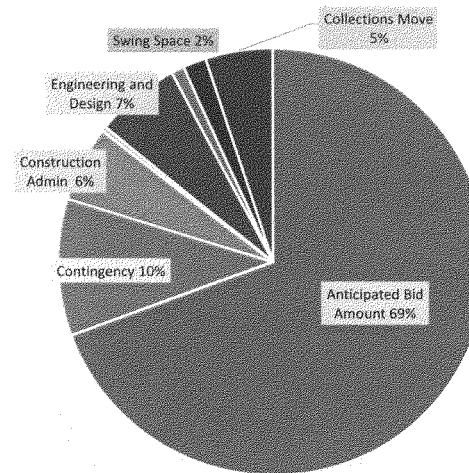
project area in gsf = 603,545 (interior gross inc North vestibule; excluding restaurant)  
project area in gsm = 56,069 (interior gross inc North vestibule; excluding restaurant)



**NASM Revitalization Current Working Estimate (CWE)**

Based on 35% Design Development reconciled estimate with prelim VE items

|   | area sq ft    | area sq meters        |
|---|---------------|-----------------------|
| <b>CONSTRUCTION</b>                           | 603,545 gsf   | 55740 gsm             |
| Anticipated Bid Amount                        |               | \$ 469,000,000        |
| Construction/Owner Contingency @15%           |               | \$ 70,350,000         |
| <b>CONSTRUCTION ADMINISTRATION</b>            |               | \$ 38,650,000         |
| Construction S&A @5%                          | \$ 23,450,000 |                       |
| Audit   | \$ 900,000    |                       |
| Engineering during Construction               | \$ 14,300,000 |                       |
| <b>COMMISSIONING (Cx) @ 0.5%</b>              |               | \$ 2,345,000          |
| <b>ENGINEERING &amp; DESIGN</b>               |               | \$ 43,500,000         |
| Planning, Studies, Design, Peer Reviews       |               |                       |
| <b>OTHER</b>                                  |               | \$ 6,500,000          |
| Data, security, exterior covered walkways     |               |                       |
| <b>SWING SPACE</b>                            |               | \$ 11,890,000         |
| <b>COLLECTIONS MOVE</b>                       |               | \$ 33,800,000         |
| <b>TOTAL</b>                                  |               | <b>\$ 676,035,000</b> |
| Construction estimate per project area        | \$ 777 /gsf   | \$ 8,414 /gsm         |
| Construction + contingency per project area   | \$ 894 /gsf   | \$ 9,676 /gsm         |
| Total Project Estimate (CWE) per project area | \$ 1,120 /gsf | \$ 12,128 /gsm        |



Mr. HARPER. Without objection, this hearing is adjourned. Thank you.

Dr. SKORTON. Thank you very much.

[Whereupon, at 11:26 a.m., the committee was adjourned.]

